

Release notes for ENDF/B Development n-097_Bk_246
evaluation

ENDF
B-VII.dev

April 26, 2017

- fudge-4.0 Warnings:

1. Cross section does not match sum of linked reaction cross sections
crossSectionSum label 0: total (Error # 0): CS Sum.

WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.30%

2. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 1 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'1 delayed'] + gamma [total fission] [nubar]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

3. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 2 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'1 delayed'] + gamma [total fission] [nubar]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (1.916123e-09) is too small

4. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 3 (total): / Form 'eval': / Component 0 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

5. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 3 (total): / Form 'eval': / Component 1 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

6. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 4 (n + Bk246): / Form 'eval': / Component 0 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

7. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 4 (n + Bk246): / Form 'eval': / Component 1 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

8. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 6 (n[multiplicity:'2'] + Bk245 + gamma): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (5.565585e-09) is too small

9. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 8 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'1 delayed'] + gamma [total fission]): / Form 'eval': / Component 0 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

10. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 8 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'1 delayed'] + gamma [total fission]): / Form 'eval': / Component 1 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

11. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 10 (n + (Bk246_e1 ->Bk246 + gamma)): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (7.364443e-10) is too small

12. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 11 (n + (Bk246_e2 ->Bk246 + gamma)): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (1.515861e-09) is too small

13. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 12 (n + (Bk246_c ->Bk246 + gamma)): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

14. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 13 (Bk247 + gamma): / Form 'eval': / Component 0 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

15. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 13 (Bk247 + gamma): / Form 'eval': / Component 1 (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

16. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 14 (n + Bk246 [angular distribution]): / Form 'eval': (Error # 1): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

17. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 15 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'1 delayed'] + gamma [total fission] [spectrum]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

18. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 16 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'1 delayed'] + gamma [total fission] [spectrum]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

19. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 17 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'1 delayed'] + gamma [total fission] [spectrum]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

20. The ratio of smallest/largest eigenvalue is quite small, possibly leading to numerical instability in downstream codes.
Section 18 (n[multiplicity:'energyDependent', emissionMode:'prompt'] + n[emissionMode:'1 delayed'] + gamma [total fission] [spectrum]): / Form 'eval': (Error # 0): Condition num.

WARNING: Ratio of smallest/largest eigenvalue (0.000000e+00) is too small

- fudge-4.0 Errors:

1. Energy range of data set does not match cross section range
reaction label 3: n + (Bk246_c ->Bk246 + gamma) / Product: Bk246_c / Decay product: gamma_a / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (170000.0 -> 2000000.0) vs (107102.0 -> 2000000.0)

2. Energy range of data set does not match cross section range
reaction label 3: n + (Bk246_c ->Bk246 + gamma) / Product: Bk246_c / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (170000.0 -> 2000000.0) vs (107102.0 -> 2000000.0)

WARNING: Domain doesn't match the cross section domain: (250000.0 -> 2000000.0) vs (107102.0 -> 2000000.0)

3. Energy range of data set does not match cross section range
reaction label 3: n + (Bk246_c ->Bk246 + gamma) / Product: Bk246_c / Decay product: gamma_b / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (250000.0 -> 2000000.0) vs (107102.0 -> 2000000.0)

4. Calculated and tabulated Q values disagree.
reaction label 4: n[multiplicity:'2'] + Bk245 + gamma (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -5753850.267852783 eV vs -5918330. eV!

5. Energy range of data set does not match cross section range
reaction label 4: n[multiplicity:'2'] + Bk245 + gamma / Product: gamma_a / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6500000.0 -> 20000000.0) vs (5942590.0 -> 20000000.0)

6. Energy range of data set does not match cross section range
reaction label 4: n[multiplicity:'2'] + Bk245 + gamma / Product: gamma_a / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6500000.0 -> 20000000.0) vs (5942590.0 -> 20000000.0)

7. Energy range of data set does not match cross section range
reaction label 4: n[multiplicity:'2'] + Bk245 + gamma / Product: gamma_b / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6500000.0 -> 20000000.0) vs (5942590.0 -> 20000000.0)

8. Energy range of data set does not match cross section range
reaction label 4: n[multiplicity:'2'] + Bk245 + gamma / Product: gamma_b / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6500000.0 -> 20000000.0) vs (5942590.0 -> 20000000.0)

9. Energy range of data set does not match cross section range
reaction label 4: n[multiplicity:'2'] + Bk245 + gamma / Product: gamma_c / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6500000.0 -> 20000000.0) vs (5942590.0 -> 20000000.0)

10. Energy range of data set does not match cross section range
reaction label 4: n[multiplicity:'2'] + Bk245 + gamma / Product: gamma_c / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6500000.0 -> 20000000.0) vs (5942590.0 -> 20000000.0)

11. Energy range of data set does not match cross section range
reaction label 4: n[multiplicity:'2'] + Bk245 + gamma / Product: gamma_d / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6500000.0 -> 20000000.0) vs (5942590.0 -> 20000000.0)

12. Energy range of data set does not match cross section range
reaction label 4: n[multiplicity:'2'] + Bk245 + gamma / Product: gamma_d / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6500000.0 -> 20000000.0) vs (5942590.0 -> 20000000.0)

13. Energy range of data set does not match cross section range
reaction label 4: n[multiplicity:'2'] + Bk245 + gamma / Product: gamma_e / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6500000.0 -> 20000000.0) vs (5942590.0 -> 20000000.0)

14. Energy range of data set does not match cross section range
reaction label 4: n[multiplicity:'2'] + Bk245 + gamma / Product: gamma_e / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6500000.0 -> 20000000.0) vs (5942590.0 -> 20000000.0)

15. Calculated and tabulated Q values disagree.
reaction label 5: n[multiplicity:'3'] + Bk244 + gamma (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -12725220.40386963 eV vs -1.28897e7 eV!

16. Calculated and tabulated Q values disagree.
reaction label 6: n[multiplicity:'4'] + Bk243 + gamma (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -18772213.10748291 eV vs -1.89367e7 eV!

17. Energy range of data set does not match cross section range
reaction label 6: n[multiplicity:'4'] + Bk243 + gamma / Product: gamma_a / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (19500000.0 -> 20000000.0) vs (19014300.0 -> 20000000.0)

18. Energy range of data set does not match cross section range
reaction label 6: n[multiplicity:'4'] + Bk243 + gamma / Product: gamma_a / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (19500000.0 -> 20000000.0) vs (19014300.0 -> 20000000.0)

19. Calculated and tabulated Q values disagree.
reaction label 8: Bk247 + gamma (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 6713608.362457275 eV vs 6549130. eV!

20. Multiplicity does not match sum of linked product multiplicities!
multiplicitySum label 5: n + (Bk246_c -> Bk246 + gamma) total gamma multiplicity (Error # 0): summedMultiplicityMismatch

WARNING: Multiplicity does not match sum of linked product multiplicities! Max diff: 23.80%

21. Multiplicity does not match sum of linked product multiplicities!
multiplicitySum label 6: n[multiplicity:'2'] + Bk245 + gamma total gamma multiplicity (Error # 0): summedMultiplicityMismatch

WARNING: Multiplicity does not match sum of linked product multiplicities! Max diff: 81.89%

22. Multiplicity does not match sum of linked product multiplicities!
multiplicitySum label 7: n[multiplicity:'4'] + Bk243 + gamma total gamma multiplicity (Error # 0): summedMultiplicityMismatch

WARNING: Multiplicity does not match sum of linked product multiplicities! Max diff: 94.63%

23. Calculated and tabulated Q values disagree.
fissionComponent label 0: /reactionSuite/fissionComponents/fissionComponent[@label='0']
(Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 230151233840.8549 eV vs 2.1461e8 eV!

24. Calculated and tabulated Q values disagree.
fissionComponent label 1: /reactionSuite/fissionComponents/fissionComponent[@label='1']
(Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 230151233840.8549 eV vs 2.1461e8 eV!

25. Calculated and tabulated Q values disagree.
fissionComponent label 2: /reactionSuite/fissionComponents/fissionComponent[@label='2']
(Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 230151233840.8549 eV vs 2.1461e8 eV!

26. Calculated and tabulated Q values disagree.
fissionComponent label 3: /reactionSuite/fissionComponents/fissionComponent[@label='3']
(Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 230151233840.8549 eV vs 2.1461e8 eV!

27. A covariance matrix was not positive semi-definite, so it has negative eigenvalues.
Section 14 (n + Bk246 [angular distribution]): / Form 'eval': / LegendreLValue L=1 vs 1 (Error # 0): Bad evs

WARNING: 9 negative eigenvalues! Worst case = -7.812736e-04

• njoy2012 Warnings:

1. Evaluation has no resonance parameters given
unresr...calculation of unresolved resonance cross sections (0): No RR

---message from unresr---mat 9743 has no resonance parameters
copy as is to nout

2. In some evaluations, the partial fission reactions MT=19, 20, 21, and 38 are given in File 3, but no corresponding distributions are given. In these cases, it is assumed that MT=18 should be used for the fission neutron distributions.
heatr...prompt kerma (0): HEATR/hinit (3)

---message from hinit---mt19 has no spectrum
mt18 spectrum will be used.

3. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (1): HEATR/hinit (4)

---message from hinit---mf6, mt 16 does not give recoil za= 97245
one-particle recoil approx. used.

4. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (2): HEATR/hinit (4)

- message from hinit---mf6, mt 17 does not give recoil za= 97244
one-particle recoil approx. used.
5. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (3): HEATR/hinit (4)
- message from hinit---mf6, mt 37 does not give recoil za= 97243
one-particle recoil approx. used.
6. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (4): HEATR/hinit (4)
- message from hinit---mf6, mt 51 does not give recoil za= 97246
one-particle recoil approx. used.
7. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (5): HEATR/hinit (4)
- message from hinit---mf6, mt 52 does not give recoil za= 97246
one-particle recoil approx. used.
8. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (6): HEATR/hinit (4)
- message from hinit---mf6, mt 91 does not give recoil za= 97246
one-particle recoil approx. used.
9. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (7): HEATR/hinit (4)
- message from hinit---mf6, mt102 does not give recoil za= 97247
photon momentum recoil used.
10. There is a problem with the fission energy release.
heatr...prompt kerma (18): HEATR/nheat (3)
- message from nheat---changed q from 2.146100E+08 to 2.042625E+08
for mt 18
11. Evaluation has no resonance parameters given
purr...probabalistic unresolved calculation (0): No RR
- message from purr---mat 9743 has no resonance parameters
copy as is to nout
12. Coefficient mismatch of some sort
covr...process covariance data (1): COVR/matshd (2)
- message from matshd---processing of mat/mt 9743/ 37 vs. mat1/mt1 9743/ 37
largest coefficient= 1.20111E+03 at index 614 618
13. The number of coefficients is too big.
covr...process covariance data (2): COVR/matshd (3)
- message from matshd--- 6 coefficients > 1
reset and continue.

14. The number of coefficients is too big.
covr...process covariance data (3): COVR/matshd (3)

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---message from matshd--- 32 coefficients > 2  
reset and continue
```